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Case Series

Granuloma or Oral Epulis: Benign Tumor with Multiple Forms

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Abstract

Oral granuloma is a reactive hyperplasia of connective tissue in response to local irritants. The name granuloma is misnomer since oral granuloma is not associated with clinical or histological signs of granuloma. This term englobes many entities with different clinical and histologic signs. Therefore, its management and follow-up will be different depending on the type of granuloma. This paper describes four different cases of oral granuloma, their clinical appearances and appropriate management.

Keywords: Oral Granuloma; Peripheral Giant Cell Granuloma; Pyogenic Granuloma; Foreign Body Granuloma

Introduction

Oral granuloma is a benign, non-odontogenic tumor of the maxillae, which most often develops following chronic aggression or irritation [1]. It can present in different forms with multiple denominations depending on its etiology, its clinical aspect and its anatomopathological characteristics. In particular, we find fibrous inflammatory granuloma or epulis, giant cell granuloma in its peripheral form, pyogenic granuloma or pyogenic granuloma, otherwise known as botriomycoma, which can also be found in pregnant women in the form of granuloma or epulis gravidis. We also find the foreign body granuloma in connection with an exogenous foreign body. The aim of this paper is to review the different aspects of oral granuloma through a series of cases, to highlight their differential diagnosis and to describe their management.

Observations

Observation 1: A young female patient, 57 years old, with no particular medical history, presented to the surgical odontology department of the Casablanca Dental Consultation and Treatment Center (CCTD) for endo-buccal swelling of the left mandibular region, which interfered with mastication, and which appeared two months before the consultation. The patient reported no particular medical history. The exobuccal clinical examination did not reveal any facial asymmetry or adenopathy. Endobuccal examination showed a hyperplastic lesion extending from the distal aspect of the left mandibular canine (33) to the site of the left mandibular 2nd molar (37). The mandibular incisivo-canine dental area and the left maxillary second molar (27) had extensive caries and plaque deposition (Figure 1). The lesion was sessile, erythematous in places, ulcerated and bleeding on contact. Panoramic radiographs showed bone rarefaction in the area of the lesion with multiple radiopacities suggestive of residual roots (Figure 2). Biopsy and removal of the lesion with bone curettage and extraction of the residual roots was performed under local anesthesia. Histological examination concluded in a giant cell granuloma.

Figure 1: Appearance of the sessile hyperplastic lesion, ulcerated and erythematous in places.

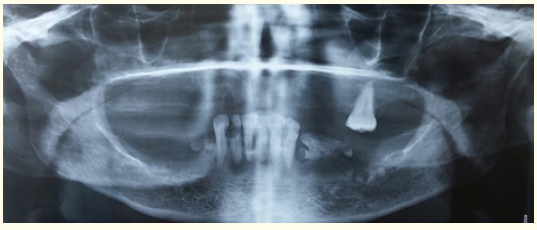

Figure 2: Panoramic X-ray showing residual roots associated with bone rarefaction in the left mandibular area.

Observation 2: A 35-year-old patient in good general health was referred to the Surgical Odontology Department of the CCTD of Casablanca by his private dentist for a hyperplastic lesion of the gingiva that recurred after a first excision. The patient reported having undergone surgery 8 months before the consultation and after 6 months of follow-up, the lesion reappeared at the same site. He had no particular medical history. Exo-oral clinical examination revealed a symmetrical face without sub-maxillary or cervical adenopathies. The endo-buccal examination revealed a gingival hyperplasia of about 3 cm of its major axis, related to the vestibular surface of the left lateral incisor (32) of the left mandibular canine (33) and of the left mandibular first premolar (34) (Figure 3). The lesion had a normal-looking overlying mucosa and was sessile. There was no pathologic mobility of the teeth. The panoramic radiograph showed no pathologic images. Treatment consisted of biopsy and removal of the lesion and surfacing of the affected teeth (Figure 4). Histological examination showed evidence of epulis or fibrous inflammatory granuloma. The 6-month follow-up showed no signs of recurrence.

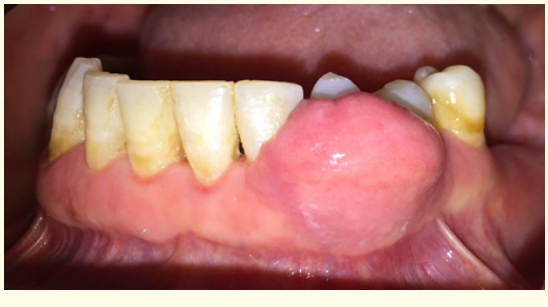

Figure 3: Appearance of a fibrous epulis with a normal-looking mucosa.

Figure 4: Immediate post-op view.

Observation 3: A 44-year-old female patient presented to the department of surgical dentistry after developing a lesion in the right maxillary area that had been evolving for two months, was not painful, bled spontaneously, and was uncomfortable to eat. The patient reported no particular medical history. The exo-buccal examination did not reveal any particular sign. Endo-buccal examination showed a hyperplastic lesion located in the palatal area opposite the two right maxillary first molars (16;17) (Figure 5). The lesion was approximately 2 cm in diameter, sessile, reddish, budding and bleeding on contact with significant mobility of 17. In addition, occlusal examination revealed dental malposition and excess overhang in the right maxillary area with the mandibular molars compressing the lesion in maximum intercuspid bite. The panoramic radiograph showed generalized marginal incipient bone lysis without any particularity in the area of the lesion. The treatment consisted in the removal of the entire lesion with extraction of the 17. Histological examination reported dense granulation tissue associated with extensive blood vessel proliferation. These signs are in favor of a pyogenic granuloma. The 1-month follow-up showed correct mucosal healing.

Figure 5: Appearance of an edematous, reddish, budding hyperplastic lesion.

Observation 4: A 40-year-old female patient consulted the Department of Surgical Dentistry of the CCTD of Casablanca following the appearance of multiple skin swellings in the right upper genital area. On examination, these swellings appeared a few days after a dental extraction and were not painful. The patient had no particular medical history. Exo-oral examination revealed multiple nodular skin masses in the right upper genital region, each about 5 mm in diameter, soft to palpation (Figure 6). Endo-buccal examination was unremarkable. Radiographic examination showed no evidence of infection. A biopsy performed endo-buccally yielded a purulent content. A thorough analysis of the interrogation at this stage revealed an injection of fillers in the same area 10 years earlier. At this stage the diagnosis of late infection due to cosmetic products, otherwise known as foreign body granuloma, was retained. The patient was referred to a fellow dermatologist who opted for treatment by intra-lesional injection of corticoids.

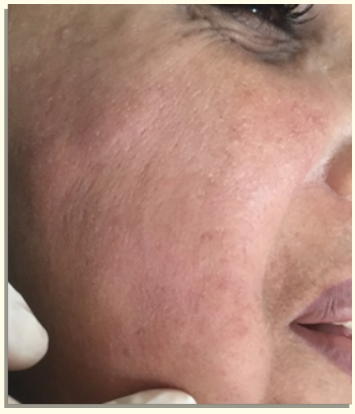

Figure 6: Exobuccal view showing multiple nodular masses of about 5 mm in diameter.

Discussion and Conclusion

Oral granuloma is known as "inflammatory hyperplasia". This term is used to describe a group of nodular hyperplastic lesions of the gingiva and oral mucosa histologically showing granulation and inflamed tissue. It includes fibrous inflammatory hyperplasia (epulis or granuloma fissuratum; extraosseous fibroma), giant cell granuloma, granuloma gravidarum and pyogenic granuloma [1,2]. What these gingival hyperplasias have in common is that they develop following stimulation. The stimulus can be of various origins: traumatic, hormonal, exogenous or endogenous.

These lesions, bearing the same name "granuloma", nevertheless present different clinical and anatomopathological characteristics.

Peripheral giant cell granuloma

Previously called giant cell reparative granuloma, since it was first described by Jaffe in 1953 as a normal local repair reaction [3]. Giant cell granuloma comprises two entities depending on its location, etiology and clinical course. On the one hand, central giant cell granuloma, classified as a giant cell tumor by the WHO, develops within the maxillae. Its etiology is still poorly understood and it will not be detailed in this work. On the other hand, peripheral giant cell granuloma presents as a soft tissue hyperplasia in response to local aggression. It is located in the gingiva, the oral mucosa, the periosteum or the periodontal ligament.

Peripheral giant cell granuloma, also called giant cell epulis, can occur at any age. It is most common in women during the third decade [4].

Peripheral giant cell granuloma (PGCG) is most often related to the teeth and is caused by chronic mechanical irritation or repetitive low-intensity trauma such as feeding or defective restorations, aggravated by the presence of plaque and calculus [5]. Trauma following dental extraction has also been reported as an etiology of GPCG [2,3].

PGCG most commonly presents as a nodular, asymptomatic, slowly progressive, sessile hyperplastic lesion [3]. It may be associated with superficial bone lysis, as in the first case, or deep bone lysis [6].

The treatment of these lesions involves, on the one hand, the removal of local irritating factors such as plaque, calculus, or defective restorations and, on the other hand, the complete removal of the lesion with or without extraction of adjacent teeth [6]. Adina Bianca Boşca., *et al*. [3] advocate curettage of the underlying periosteum and immediate extraction of the interrelated tooth(s) if deep infiltration of the granuloma between the roots is noted intraoperatively. A recurrence rate of 5% has been reported after complete resection of the PGCG [7]. In the first case reported, with a 50-year old woman, residual roots appeared to be involved in the formation of the lesion and treatment consisted of complete resection of the lesion with extraction of these residual roots.

Pathologic examination showed vascular stroma with spindle fibroblastic cells, multiple areas of hemorrhage with abundant hemosiderin pigments, and mono- and multinucleate giant inflammatory cells [6,8].

The differential diagnosis between PGCG and other hyperplastic lesions such as epulis fissuratum or pyogenic granuloma will be based on clinical and anatomopathological confrontation. Furthermore, when faced with a lesion with a PGCG appearance, it is necessary to eliminate the diagnosis of brown tumor of hyperparathyroidism by serum parathyroid hormone assay [9].

Fibrous inflammatory granuloma/epulis

Fibrous epulis, like other reactive hyperplastic lesions, usually presents as a growth following chronic local irritation [10].

It may be sessile or pedicled and is most often covered by a normal-looking mucosa. The second case presents a sessile hyperplasia covered by normal mucosa. Its evolution is slow and limited to the covering mucosa without bone lysis. The treatment of fibrous epulis consists of complete removal and elimination of irritating etiological factors. Histological examination shows a squamous epithelium and a well-vascularized connective tissue, not very cellular but especially rich in collagen fibers [11].

This patient had presented a recurrence after his first surgical removal at his dentist's. This could be due to residual calculus, responsible for chronic inflammation and irritation. etiological treatment is essential in the management of fibrous inflammatory epulis.

Pyogenic granuloma

This hyperplastic lesion was first described in humans in 1897 by Poncet., *et al* [12]. Named Botriomycome, it has been given several names such as benign pedicle granuloma, pregnancy tumor, vascular epulis or benign vascular tumor [13].

The term pyogenic granuloma, widely used in the literature, was introduced in 1903 by Crocker [14] and referred to an infectious origin. Today, it is accepted that this lesion is due to a vascular disorder of multifactorial etiology such as chronic irritation of low intensity (plaque, tartar...), trauma, hormonal disorders or certain medications [13,14]. Iatrogenic factors have also been reported, as in the case of Fowler., *et al*. following a guided tissue regeneration technique [15].

The incidence of pyogenic granuloma (PG) is highest between the 3rd and 5th decades and affects women preferentially [14]. In 75% of cases, it involves the gingiva, but PG is also found in extragingival sites such as the lips or tongue [1].

Clinically, PG is a smooth or lobulated exophytic lesion, which manifests as small red, pedicellated or sometimes sessile erythematous papules that are usually hemorrhagic and compressible. Its evolution is usually slow, asymptomatic and painless. In the initial stage, the pyogenic granuloma is very erythematous and bleeds easily. This is due to the predominance of granulation tissue, thus of blood capillaries. At a more advanced stage, the PG tends to have more collagen and therefore has a pink appearance [1].

Several techniques have been described for the treatment of pyogenic granuloma depending on its location and progression. These techniques range from therapeutic abstention to invasive resection with healthy bone margins. In general, conservative surgical resection and removal of etiologic factors such as calculus are the most commonly used techniques [1]. A recurrence rate of 16% has been reported with a predominance of gingival forms [14,16].

Cryosurgery and laser surgery are also used for the treatment of PG [1,14].

The case reported in this work is a 44-year-old woman with a gingival pyogenic granuloma in whom the treatment consisted of a scalpel excision.

Histologic examination shows a highly vascular proliferation resembling granulation tissue. There are ducts swollen with red blood cells and lined with endothelial cells. These blood vessels present a clustered pattern separated by fibrous septa. This leads some authors to consider PG as a form of inflamed capillary or lobular hemangioma. Others use the term hemangioma-like granulation tissue. Chronic inflammatory cells are constant [1].

The differential diagnosis of PG is made with hyperplastic lesions of the oral cavity such as peripheral giant cell granuloma, which usually results in bone lysis. In addition, the clinical appearance of oral metastases of malignant tumors strongly resembles pyogenic granuloma; hence the importance of histological examination.

Another differential diagnosis is that of tumor of pregnancy or epulis gravidarum. Some authors consider it to be the same lesion, given their identical clinical and histological aspects. Others suggest to consider epulis gravidarum as a different entity from PG because it is closely influenced by female sex hormones [1]. Indeed, the review by Juliana Andrade Cardoso., *et al*. [17] devoted exclusively to granulomas gravidarum, reported clinical, epidemiological and histological data similar to pyogenic granulomas. The only distinction is in the treatment. In some cases of granuloma gravidarum, the lesion regresses and disappears spontaneously after delivery and readjustment of hormones. Surgical intervention during pregnancy should only be indicated in cases of significant facial deformities with aesthetic impact or unsustainable bleeding [17].

Foreign body granuloma

It includes all hyperplastic lesions that react to an exogenous foreign body. Among the most frequent are foreign body granuloma due to cosmetic products and foreign body granuloma on legume seeds.

Cosmetic foreign body granuloma

In recent years, concerns about age and facial aesthetics have become increasingly important. As a result, the use of cosmetic products on the face has increased. Indeed, among many dermatologists and plastic surgeons, the demand for injection techniques for wrinkle treatment or soft tissue augmentation has increased significantly [18].

Several products are used and the absence of an ideal product puts patients at risk of various side effects, particularly granuloma-type lesions. The majority of foreign body granulomas related to cosmetic fillers are related to hyaluronic acid [19]. These lesions are encountered mostly in women between 44 and 78 years of age. Foreign body granulomas related to cosmetic products are found in the areas affected by injections, preferably the lips. They present as multiple nodules of about 5 - 8 mm in diameter, covered by a normal looking mucosa. These lesions, at an advanced stage, appear as cystic granulomas by encapsulation. The diagnosis of foreign body granuloma by injection of hyaluronic acid can be difficult to confirm in case the injection is old. Indeed, the adverse effects of most of these products, such as foreign body granuloma, may appear long after their use. The effects can be either immediate, early (after a few days) or delayed (a few weeks to a few years) [20]. The case reported in this work is a 40-year-old woman who had undergone filler injections 10 years earlier. This patient had tried different medical and surgical treatments end radiological explorations in vain during theses 10 years. This highlights the value of medical history at the consultation.

The treatment of choice for these lesions is intra-lesional injection of corticosteroids. The use of systemic corticosteroids would also be effective in recurrent cases [21]. Rzany B., *et al*. [22] reported the efficacy of hyaluronidase in the treatment of granulomas by injection of hyaluronic acid.

Pathological examination shows a well-demarcated fibrous nodule composed of amorphous eosinophilic flake-like material (transparent) surrounded by multinucleated giant cells and an infiltrate of inflammatory cells. These eosinophilic materials are birefringent in polarized light [19,23].

Foreign body granuloma on leguminous seeds

This type of oral lesion is a rare chronic inflammatory reaction caused by the inclusion of plant fragments in the soft or bony tissues of the oral sphere. They present clinically as swellings, preferentially involving the mandible posteriorly, recurrent and painful to palpation [24].

The first cases of foreign body granuloma on leguminous seeds, formerly known as chronic periostitis, were described in 1971. The treatment of choice would be curettage of the lesion while avoiding trauma to adjacent tooth surfaces. Histological examination is similar to the appearance of a foreign body granuloma due to cosmetic materials [24]. The arrangement of the hyaline collagen in a concentric shape makes this lesion often referred to as a vegetable hyaline ring granuloma [25]. The literature review by Hans Peter Philipsen., *et al*. [26] reported 173 cases of pulsating or hyaline ring granuloma.

Foreign body granuloma can also be iatrogenic, in particular by the omission of non-absorbable sutures in the mouth. The management will consist in the removal of the tumor with a curettage to eliminate the foreign body.

Oral granuloma remains a benign tumor of the maxilla because it does not lead to degeneration. Nevertheless, given its local aggressiveness and tendency to recur, it is important to make a correct diagnosis in order to ensure the best management.

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